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Journal of the Society of Arts.

FRIDAY, DECEMBER 28, 1860.

COUNCIL.

At the last meeting of the Council, Mr. Henry Cole, C.B., was elected a Vice-President of the Society, to fill the vacancy caused by the death of the late Mr. Matthew Uzielli; and Mr. Matthew Henry Marsh, M.P., was elected a Member of Council, in the room of Mr. Henry Cole.

EXAMINATIONS, 1861. — NOTICE TO INSTITUTIONS AND LOCAL EDUCATIONAL BOARDS.

The attention of Secretaries of Institutions and Local Boards is specially called to Par. 5 of the Programme of Examinations for 1861, as follows :—

5. A detailed list of the chairman, secretary, and other members of each Local Board, giving not only their names but their addresses and designations, should be submitted to the Council of the Society of Arts before the 1st of January, 1861. In some cases the Local Educational Boards comprise such large districts that for the convenience ot the Candidates, Branch Local Boards have to be formed within the Districts. Wherever this is the case, the names and addresses of the members, both of the District Board and of its Branch Boards, must be forwarded to the Secretary of the Society of Arts. All changes in the composition of the various Boards now in existence, or to be formed hereafter, should be immediately notified to the Society of Arts.

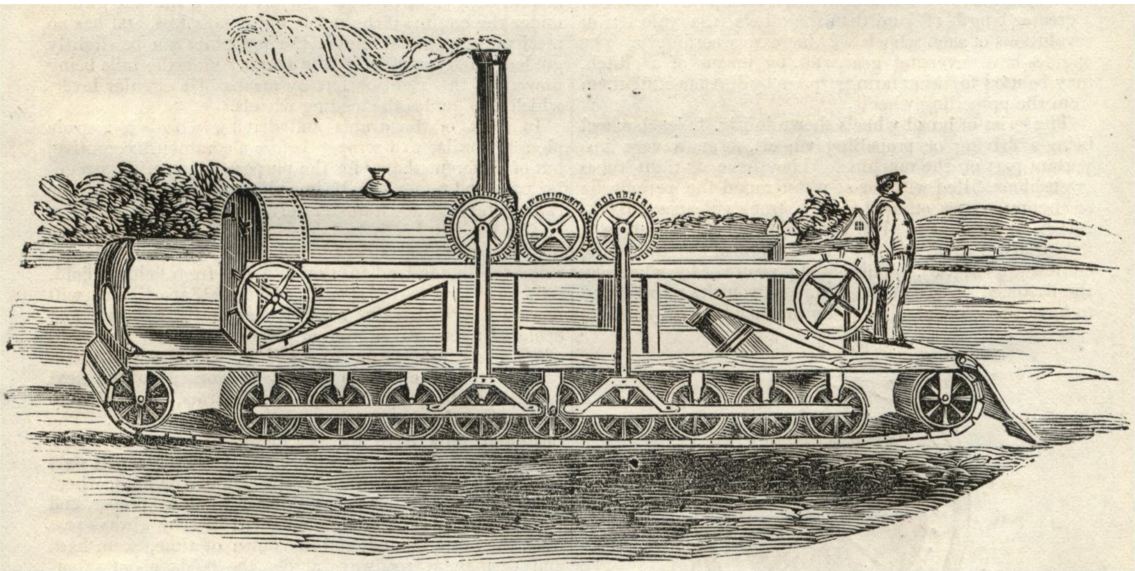
LAMBETH SCHOOL OF ART.

The students of the Lambeth School of Art propose to hold a conversazione at the South Kensington Museum, on Saturday evening, the 12th January, in aid of the fund for their new building. The charge for admission will be one shilling.

PATENT LOCOMOTIVE CULTIVATOR.

This machine invented by Mr. Henry Grafton, consists of a framework, with a series of broad driving wheels on each side, having air tubes or India-rubber cushions round the peripheries and travelling on a self-acting endless rail.

Fig. 1.



The framework is made chiefly of iron, and somewhat resembles the Guideway platform invented by Mr. Halkett,[*] being fifty feet or more wide, so as to pass over and harrow, drill, hoe, &c., the whole of that breadth of land at the same time, and to plough as great a part as the power of the engines employed will allow, without the slightest pressure on the land under tillage. It is made with a series of girders resting on, and at right angles to, the side trussed girders. These side girders form receptacles for the engine and boilers, and for the supply of coal and water (Fig. 1), and are boarded in. In this arrangement the weights are thrown to the lowest point of the machine, and space and heat economized. The cross girders can be disconnected from the side girders, and the latter brought side by side, to facilitate the conveyance of the machine from one field to another, on the common road. Such a removal from one small enclosure to another is not however, contemplated. All the implements to be used (whether ploughs, harrows, hoes, drills, reaping machines, or others) will be suspended from the framework, and are to be of the ordinary construction, divested of wheels and shafts, fixed in frames running between the cross girders, capable of being moved from one side of the cultivator to the other. (See Fig. 2, showing a traversing plough frame, with cross head and screw lever, as seen from above the platform.)

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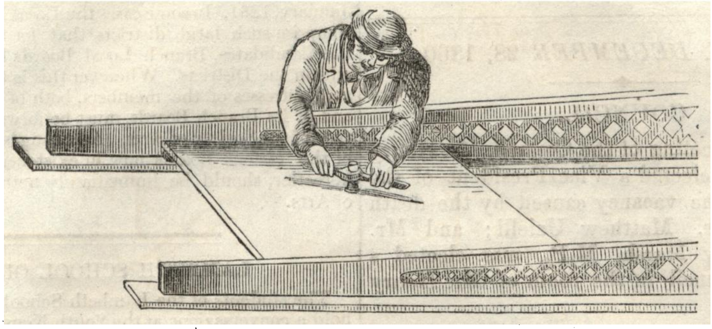
[*] See *Journal*, Vol. vii., p. 41.

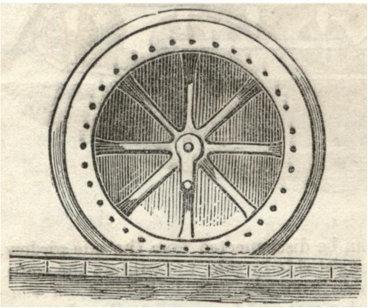
FIG. 2.



The carriage of crops, manure, &c., is done by means of a frame, with a flat floor suspended from the girders by iron straps within eighteen inches of the ground, or lower if suspended from the middle of the cross girders, without any supplementary trucks or waggons. This frame can be lowered to the ground, and by a pair of screws and lever nuts, raised again to the required height. The engines are not in anyway connected, and the inventor says there is no occasion for them to be so, as both sides of the Cultivator progress at the same rate, even if the engines be of different power; no motion takes place on one side of the Cultivator without being communicated to the other side, through the framework, the bracings and great strength of the girders and general trussing precluding any contrary action, for even if one series of wheels have to pass over any slight elevations or undulations, and so to transverse a greater length of land than the others, the velocity or revolutions of such wheels will increase accordingly. The engines have reversing gear, and, by means of a clutch, may be used for other farm purposes by disconnecting them from the propelling wheels.

The series of broad wheels shown in Fig. 1, (each wheel being a driving or propelling wheel), forms a very important part of the machine. They have air-tight tubes or cushions, filled with air or water round the peripheries or circumferences, encased in very strong vulcanized India-rubber fabric so as to give, by weight of the machine, a flat surface of equal pressure on the whole of the shoe of the endless rail (Fig. 3). This equal pressure of the wheels by the flattened surface of the cushions upon the rail is stated to have the effect of closing up the openings or joints of the wooden shoes, giving a firm and rigid line of rail, which is further steadied by flanges on all the driving wheels of the width of the shoes, which have angle-iron (adjusting outwardly to allow for wear); and also of equalizing or distributing the whole weight of the machine on the rails, so that it is on no part greater than the amount of pressure of a man's foot on the ground; the air tubes, although strong in themselves, will be protected from injury by the flanges and side girders.

FIG. 3.



This is the first time air-wheels have been brought before the public in connection with Steam Agriculture, but they have been used on the wheels of vehicles on the common roads in London; and a Brougham with tires of this sort has been known to run upwards of 2,000 miles at the average rate of eight miles an hour; in this case the wheels will only make twenty revolutions in a minute, and will be travelling on a smooth surface, circumstances that, it is thought, will ensure their continued good condition.

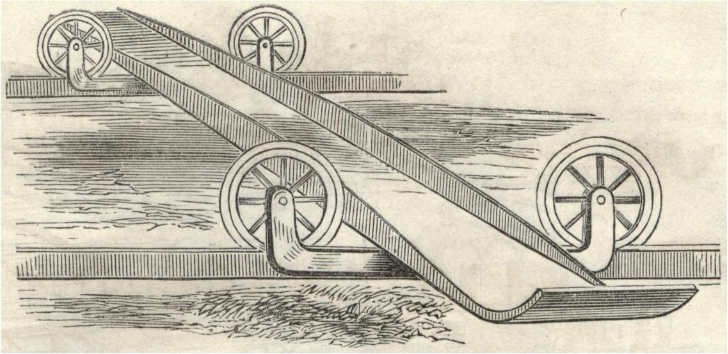
The endless railway consists of a continuous belt of very strong India-rubber combined with flax threads, having wooden shoes about twelve inches by eighteen, shod with iron, fastened to it by a staple across the centre of each shoe, at right angles to the belt, which permits it to pass round the drums placed before and behind each series of wheels, and through the side girders under the engines; the rail is quite noiseless, and has no mechanical or metal joints; the machines can be slightly guided when required, by the drums laying the rails being moved to the right or left by means of a circular lever, which also guides the leading wheels.

In front of the drums and driving wheels is a spade plough, similar to a scraper before a common locomotive, but of different shape, for the purpose of clearing a regular path and removing all impediments, to permit of the rails being laid down moderately even.

The headland is to be laid with rails, forming a permanent and more convenient mode of taking the Cultivator from the homestead to the field, or from field to field. The rails are to be about twelve feet apart, and will receive the Cultivator after it has traversed over, and operated upon, one stretch or breadth of land, by means of two separate beam trucks (Fig. 4); the Cultivator being received on these trucks, is worked to the next breadth of land by means of radial arms, lowered from the engines, having at the ends propelling wheels. The headland rails have distinct marks at every fifty feet, to serve as points from which the Cultivator will start from time to time for the opposite side of the field, where a flagstaff may be left as a guide, if thought proper, and thus the wheels and endless rails will thereby always pass over the same ground, and in course of time, form hard and permanent roadways across the fields, about a foot-and-a-half, or two feet wide, at intervals of every fifty feet, taking no more land from actual tillage than the present open furrows. The land would thus be cultivated in strips of fifty feet, upon which no pressure, either of the Cultivator or implements, will take place.

The ploughs are right and left (Fig. 5) suspended upon the girders and attached to the plough, having a rack arrangement for raising and lowering them into working position. The cranks of the driving-wheels have Clark's compensating connecting beams, to allow for all undulation which may arise on the land; this permits the rails in connection with the elastic tires to find a line conforming to the land over which the Cultivator passes. Independently of these, arrangements are made

FIG. 4.



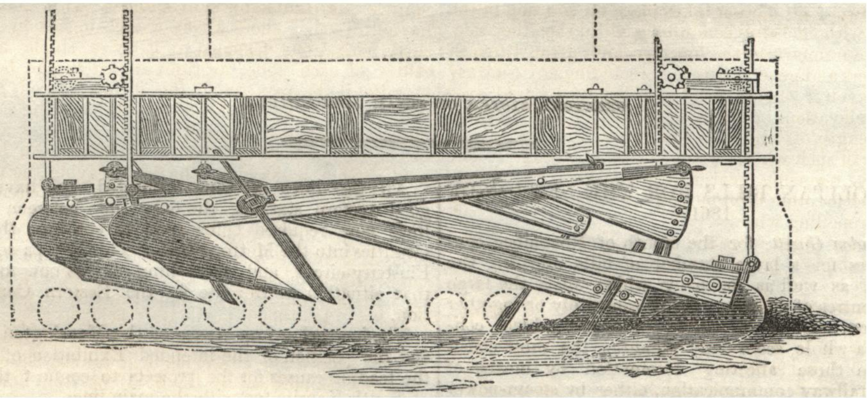
for balancing the cross girders loaded or otherwise, which permit this description of locomotive to be made light and strong.

The space of twenty-five feet of headland may be cultivated as grass land, and have a framework of wire fencing moving on wheels to separate it from the arable part, and this fencing roofed in so as to shelter cattle. It may be moved by means of a winch.

In small enclosures one headland will suffice, but in large fields a headland on each side is preferable.

On the framework of the Cultivator, a temporary cabin is erected for the use of the engineer and attendant, when far from the homestead, whose duties will be to take care of, as well as work, the machine, and an awning may be thrown over to protect the men from the heat of the sun or weather, when at field work.

FIG. 5.



The following estimate of the annual expenses of a farm of 1,000 acres, cultivated by steam-power under this system is given by the inventor:—

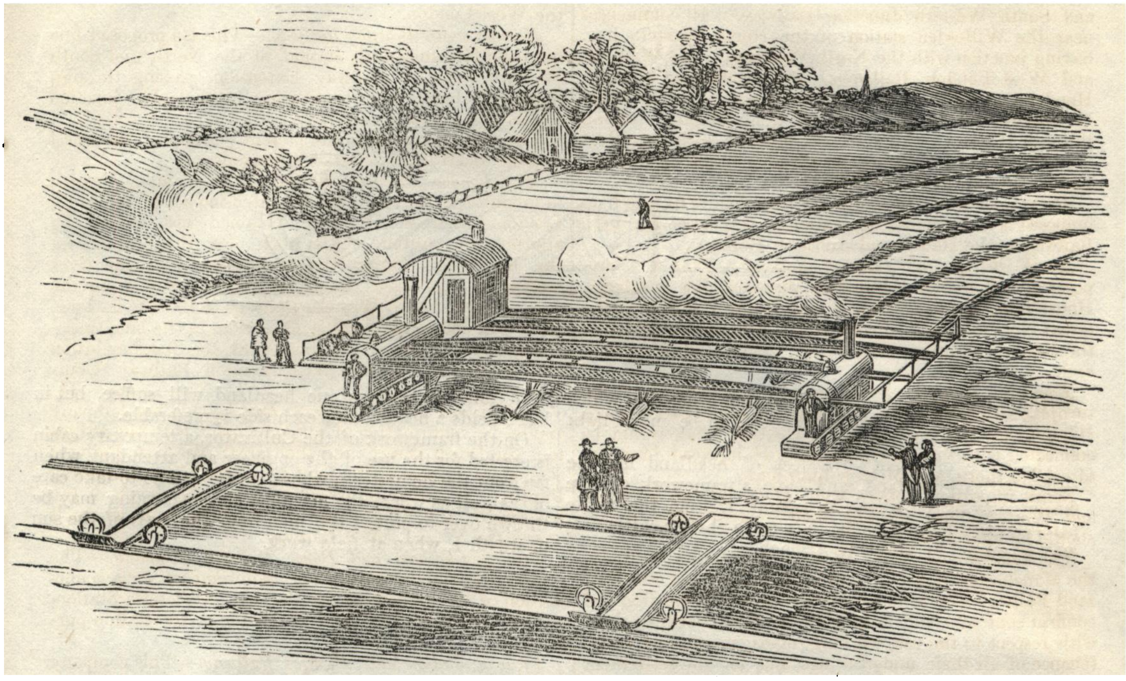
Expenses and depreciation of endless rail, locomotive, and implements, costing £1,500 at 15 per cent.	225	0	0
Coal at 20s. per day, 250 days	250	0	0
Oil, &c.	10	0	0
Engine driver at 4s. per day and two attendants at 2s. per day each	124	16	0
5 constant labourers	155	0	0
Labourers for hand operations	50	0	0
	£814	16	0

Annual expenses of a farm of one thousand acres, cultivated by horse-power under the present system on clay lands:—

STATEMENT BY MR. W. REX, VALUER TO MESSRS. CHINNOCK AND GALSWORTHY, LAND AGENTS, LONDON, AND A FARMER, FOR A FARM OF 200 ACRES, WELL TILLED LAND.

Capital : — 8 horses, 4 ploughs, harrows, horse-hoes, scarifiers, 2 waggons, rollers, 4 carts, £500

		ANNUAL		
Depreciation of stock at 15 per cent. ...		£ 75	0	0
Horse-keep, corn, 100 qrs., hay 30 tons ...		244	0	0
Labour, 4 carters, at 12s. per week	£124 16s.			
1 horse-keeper extra	31 4			
3 labourers	105 6			
		261	6	0
100 acres corn hoeing, 4s.		20	0	0
Cutting 50 acres of corn at 8s.		20	0	0
		620	6	0
Multiply by 5 for 1,000 acres ...				5
		3,101	10	0
Deduct 15 per cent. on £200 the saving in machinery on a large over a smaller		30	0	0
Farmers' annual field expenses for ordinary cultivation on the fourth or fifth shift system, exclusive of all extra labour for harvest, &c., but including all that can be done by the machinery in the field ...		3,071	10	0
Deduct estimated cultivation by steam		814	16	0
Estimated difference in favour of this system		2,256	14	0



GRAFTON'S SYSTEM OF STEAM AGRICULTURE.

METROPOLITAN BILLS FOR THE SESSION OF 1861.*

The *London Gazette* for the month of November contains notices for a large number of bills affecting the metropolis, as well as for many which affect the large northern centres of industry, either separately or together with London. Of these various proposals, which, considered as a whole, seem truly gigantic, the most considerable are those affecting locomotion by means of additional railway communication, either by steam-power or horse-power; and connected with the latter are the numerous schemes for laying down tramways in the public streets. The railways of London, and their interpenetrations with the cobweb of streets which the combined ingenuity and obstinacy of ten centuries have produced, demand however, our first attention.

The decision of the Commisioners that no railways should be allowed to be carried further within the limits of the metropolis than the stations then in existence, has been reversed by common consent.

The Brighton Company obtained their West-end and Crystal Palace line, and the Victoria Station was opened to the Chatham and Dover and to the Great Western lines, with which neither the South Eastern nor South Western was connected. The two latter combined to carry out the whole plan of the South Western in the Charing-cross Railway, evidently an improvement for business purposes upon the Victoria Station.

The Metropolitan Railway, which for years waited the assistance of the Great Western and Great Northern Companies, its Act having been obtained in 1854, is now constructing.

The London, Chatham and Dover have obtained their act for a direct line into the City to meet the metropolitan, and the central station of the latter becomes a great centre of interest.

All the lines are thus connected, and have obtained good western stations, the only link between the main lines now required being that to continue the Eastern Counties into the Metropolitan. This line passes through Finsbury-circus, and everything agrees now to point out that situation as the site for the Eastern Central Station.

The increasing importance of the Kensington Museum, and the position of the intended Exhibition of 1862, are the leading causes for the projects to connect the district of South Kensington with the main lines.

The whole system of metropolitan railway communication becomes, under the conflicting interests of the now powerful companies, so complicated that it is somewhat difficult to apportion the schemes to the real wants of travellers.

To commence, however, in our endeavour to intimate the several schemes now before the public, the outlying railways may be first considered, commencing from the east.

London and Bury St. Edmunds Railway,—This is a proposed direct line to Bury, commencing at Barking on the London, Tilbury, and Southend line, going through the agricultural and picturesque districts of Chipping Ongar, Dunmow, and Haverhill, between the Cambridge and Colchester trunks of the Eastern Counties line, having junctions with the authorised "Colne Valley and Halstead Extension" and "the Sudbury and Clare" railways.

The following projects are intended to connect the Eastern Counties and Great Northern lines with the western main lines, or to act as feeders thereto, opening up parts of the suburban districts.

Hornsey and Tottenham Railway.—This is a proposed junction line from Wood Green on the Great Northern Railway to the Cambridge line of the Eastern Counties Railway at Tottenham.

North Eastern and South Western Railway.—This line proposed to form a continuation northwards of the North and South Western Junction Railway. It commences near the Willesden station of the North Western line, having junction with the North Western, Great Western, and West London Railways, and continuing through Hendon and Finchley to East Barnet station on the Great Northern, and having a branch from Hendon passing through Hornsey, with a second junction with the Great Northern line, and joining the Eastern Counties Railway Cambridge line at Tottenham.

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* Contributed to the *Building News* by Mr. J. M. Rickman.

Barnet and Willesden Railway Company.—The line here proposed is from the Barnet station of the Great Northern Railway to the Hampstead Junction Railway.

North Metropolitan Junction Railway.—This is a proposed line from the Hampstead Junction line at Gordon House-lane, Kentish Town, to the Hornsey station of the Great Northern, and thence to the Tottenham station of the Eastern Counties line, having double junctions with each.

Edgware, Highgate, and London.—Commencing at the turnpike at Edgware, the proposed line would pass through Hendon and Highgate, and, by junction lines, would be connected with the North London, Hampstead Junction, Great Northern, and Metropolitan lines.

Some important notices were given by the Northern and Western lines affecting their general policy, which should be introduced here.

The London and North Western, the Great Northern, the Manchester, Sheffield, and Lincolnshire, and the Midland Railway Companies apply for an act to sanction and confirm contracts and arrangements made between them with respect to the use, working, management, and maintenance of all their undertakings, and for the settlement of their mutual traffic arrangements, and for the appointment of persons authorised to carry into effect their contracts.

Birkenhead Railway.—Application is made with a view of transferring this concern to the North Western and Great Western companies, for their joint use, for a term of years.

Great Western Railway Company.—This is a proposed act to settle the capital of the Railway Company, and to enable them, if it should be decided to be advantageous, to lay down narrow gauge from Reading, and to raise capital for that and other purposes.

By another notice the same company applies for extension of time for sale of their superfluous lands, which under the "Land Clauses Consolidation Act," is limited.

The next list contains important feeders to the North Western, Great Western, and West London Railways.

St. Albans and Shefford Railway.—This is a line proposed by the North Western Company (from their St. Alban's line), and by the Midland Company (to their Shefford Station) to connect their lines, and to join and cross the Hertford, Luton, and Dunstable Railway.

London, Buckinghamshire, and West Midland Railway.—This is a project for a direct line from Oxford to London. It commences by junction with the West Midland (late Oxford, Worcester, and Wolverhampton), and with the Oxford branch of the North Western Railway at Yarnton, and passing through Thame (with a branch to Aylesbury), Amersham, Brentford, and Chelsea, terminates with a junction with the authorised Kensington station line at Earl's-court, with a branch to the West side of Sloane-street, and junctions with the West London Railway, and with the North and South Western Junction Railway.

Metropolitan and Great Western Railways.—Extension to Richmond.—The Great Western Railway, having already a branch going in an easterly direction to Brentford, propose to use part of it, with the assistance of two branch lines at Hanwell and Isleworth, to draw the traffic from the south-western foot of Richmond-bridge. It is also proposed to have a junction with the loop line of the South Western Railway.

Hammersmith, Paddington, and City Junction Railway.—This is a proposed line from the Broadway, Hammersmith, to the Great Western, with a double junction with the West London.

Hammersmith Junction Railway.—This is a proposed line from the Hammersmith station of the North and South Western Junction Railway Extension, passing througq Shepherd's-bush, and terminating by a double junction on the West London Railway.

The following refer to the present position of the West London and Victoria Station Companies:—

West London Extension Railway.—This is an application to modify the powers under the extension act of the West London Extension Company, obtained last session, by altering the position of the dock near the entrance of the Kensington Canal, the abandonment of the river branch at that place; to widen Pig-hill-lane from the arch over the South Western Railway to Latchmere-lane, Battersea, and to make other alterations in the lane thereabouts; and to provide, if thought fit, for the dissolution and winding-up of the West London Railway Company.

London and North Western Railway.—The company applies for confirmation of an agreement with the Brighton, the Dover Direct, and the Great Western Railway companies, respecting the joint use of the Victoria Station, Pimlico. It is also proposed to alter the levels of the Kensington and Hammersmith turnpike-road, where it crosses the West London Railway.

London, Chatham, and Dover Railway Company.—The company applies, among other requirements, for a confirmation of an agreement for the use of Victoria Station, and to obtain further land at Battersea for station purposes.

Victoria Station and Pimlico Railway.—This company applies for power to raise additional capital, and to give effect to agreements with the Great Western and Dover Direct Companies for the use of Victoria Station.

There are three for additional junction lines in the Southern part of the metropolis; the last is a bold scheme.

West London Extension, and London, Brighton, and South Coast Junction Railways.—This is a proposed south metropolitan line, commencing out of the West London Extension line, at Battersea, and connected with the Crystal Palace line, passing through Camberwell and joining the Brighton line and Thames Junction Railway near New-cross.

South London and City and West-end Junction Railways.—This is a proposal based upon the London, Chatham and Dover Railway, intending to connect it with the main line and branches of the Brighton Railway Company. The new lines will consist of a railway from the West-end section of the Dover line, at North Brixton, and terminating by a set of small junction lines with the Brighton and Thames Junction lines at New-cross, having also a junction with the City section of the Dover line in Lambeth, and also a line at Battersea joining the Battersea line of the West-end and Crystal Palace Railway with the West-end section of the Dover line.

Charing-cross Railway (City Terminus).—This is a proposal for providing a City terminus for the Charing-cross Railway, for the special benefit of the South Eastern line. Having a double junction with the Charing-cross line to the south-west of St. Saviour's church, and having a bridge across the Thames, the line would terminate at Turnwheel-lane, on the south side of Cannon-street.

In the south-eastern district are the following:—

South Eastern Railway.—Apply for powers to subscribe further sums (raised by bonds or preference shares) to the Charing-cross Railway. Also for powers to alter-by-laws of Greenwich Railways, and to consolidate their accounts.

Greenwich and Woolwich Railway.—A line is here proposed from the Greenwich at Deptford-creek to Edward-street, East Greenwich, and a branch from the same to connect it with the North Kent Railway at the Charlton station.

Mid Kent Railway (Croydon Extension).—The company applies for power to continue their proposed extension to Coombe-lane.

Having now returned nearly to the starting point, the central lines claim examination. The South Kensington Museum draws the following schemes:—

Kensington Station, and North and South Junction Railway.—This company, which obtained its Act last year, applies for enlarged powers, and proposes to construct the following additional sections of railway:—A junction with the West London Extension Railway, at the corner of the Kensington Canal Basin. An extension from Love-lane to the corner of the Gloucester-road and the Cromwell-road, and so on to the eastern side of the Queen's Gate-road. They also apply for powers to join any other company having similar objects.

Metropolitan Railway (Western Extension).—The extension here proposed to the Metropolitan Railway is a continuation from the front of the Paddington station along Conduit-street and Craven-hill to the Queen's-road, and thence having branches to Notting-hill and through the Broad-walk in Kensington-gardens to Noel House, near the toll-bar in the Kensington-road, and a further extension to the intersection of Cromwell-road with Prince Albert's-road.

The Metropolitan Railway forms the introduction to the Smithfield Market and Finsbury-circus station, connected with which are the following, which will sufficiently explain the proposed undertakings, which can hardly be considered as competing schemes, but rather as parts of a very serious project, though it must be a long time before we see the whole carried out.

West-end and City Railway.—This is a proposed underground railway from Regent-circus, Piccadilly, through Coventry-street, Leicester-square, Long-acre, Great Queen-street, and part of Holborn, and across Victoria-street, to the authorised "Metropolitan and London Railway Depôt," lines at Smithfield-bars.

Metropolitan Railway.—The company applies for an extension of time in carrying out their arrangements; for power to take additional property in the neighbourhood of Praed-street, and thence to Stafford-street, Paddington, and to widen their line, and to take additional property between King's-cross and Ray-street, Clerkenwell; to form an additional junction line at King's-cross, and another to the proposed meat and poultry market at Smithfield-bars, in place of that previously authorised; to confirm the agreements made with the City authorities for the purchase of land adjoining the station, and for the construction of an underground depôt and station at Smithfield.

The company also applies for power to continue their Smithfield Extension line to Finsbury-pavement.

Finsbury Circus Railway Station.—This is a scheme to provide station accommodation at Finsbury circus for the proposed Eastern Counties and Metropolitan Extensions; the district proposed to be used is bounded as follows. beginning at the south-west:—Moor-lane, New Union-street, Little Moorfields, South-place, Eldon-street, Broad-street-buildings, New Broad-street, Bloomfield-street, London-wall, and Fore-street. The various streets now leading to Finsbury-circus would be stopped up; a new street would be opened from the south end of Circus-place in London-wall, running south-west into Moorgate-street; and a street would be cut from the centre of the last mentioned to the north-east corner of the Bank of England. These new streets would open up the miserable district at the back of Tokenhouse-yard.

North London Railway.—A line is proposed from Ball's-pond, connected by a double junction with the present line, and running into the City, having its terminus in the space enclosed by Liverpool-street, Bloomfield-street, Eldon-street, Long-alley, Sun-street, Peter-street, and Broad-street-buildings.

The North London Railway Company also proposes to widen the line between York-road and Kingsland-road.

Eastern Counties and Finsbury Railway.—This is a scheme for continuing the Eastern Counties line from Shoreditch to Bloomfield-street, Finsbury-circus. The linewould commence at Arundel-street, Bethnal-green, keeping south of the Shoreditch station. A new street would be formed in continuation of Phœnix-street to New James-street, in place of the present streets in that district. The line would cross the New Commercial-street and Norton-folgate, and then, going through the low courts and alleys west of Bishopsgate-street-without below the surface, arrive at the west side of Bloomfield-street.

The present streets between the northern part of Commercial-street and Norton-folgate would be obliterated, and a new street cut at right angles to Commercial-street from the end of White Lion-street to the street which has been long laid out on the north side of the church now building in Commercial-street. Part of Liverpool-street would also be stopped up, and Broad-street-buildings widened in line with Eldon-street, and continued across into the eastern part of Liverpool-street. As the railway would be mostly under the surface, the present sewerage would be disturbed, and consequently a new sewer would be constructed from Norton-folgate to Finsbury-pavement, to divert all the sewage into the latter direction.

The Court of Common Council have adopted a report of their Improvement Committee, relative to the establishment of a central railway station in the city of London. The report stated that it was absolutely necessary that there should be a central railway station in the City, and that the best site for it would be Farringdon-street;—that the effect of having the station at this spot would be materially to improve Holborn-hill and Skinner-street, and reduce the gradient from one foot in 19 to one foot in 40 in the case of Holborn-hill, and one foot in 46 in Skinner-street, which alone would be a most important improvement; that it would also greatly improve the City property in Farringdon-street and Victoria-street, and be of very great importance in conection with the proposed new market in Smithfield. The report concluded with a recommendation that the court should continue their powers to carry out the proposed plan.

PLASTIC WOOD.

The Paris correspondent of the *Times* states that an artist in Paris has made a discovery which will effect a complete revolution in the manufacture of cabinet-work. He has found a means of rendering any description of wood so soft that it will receive an impression either of the most varied sculpture or of the most delicate chasing. The wood is then hardened to the consistency of metal, while the impressions remain perfect. The artist has already completed some splendid sculptured articles, such as picture frames, inkstands, chests, and liqueur stands. With the introduction of this new art, it is expected that articles of household furniture will be considerably reduced in price.

MEMORIAL OF CROMPTON.

The people of Bolton have subscribed to erect a statue to Samuel Crompton, who invented the "mule," which has given fortunes to hundreds and bread to thousands. After some discussion the commission has been given to Mr. W. Calder Marshall, R.A.

EXTRACTS FROM THE REPORTS OF H.B.M. CONSULS.

(*Continued from page* 79.)

Mines.—Throughout the province of Iquique have been discovered metals, gold, silver, copper, and iron; towards the southern boundary stream, tin and lead; and towards the Cordillera, platinum. The silver mines of Huantahaya and of Santa Rosa, respectively 7 and 12 miles from Iquique, once so productive, are almost entirely abandoned; 2 at Huantahaya only are constantly worked. The other mines are occasionally entered by a few Indians to gather stray pieces of ore, from which they extract the metal, and bring it mostly in small pieces of *pina* under one pound in weight, to Iquique for sale. For some years mining in this province has been much neglected, owing to the scarcity of labour and the high rate of wages paid since the commencement of the nitrate of soda trade, as well as the inconveniences of having to bring fuel, water, and provisions from distant parts, but of late attention is again being paid to it.

At Tabucaga, about 50 leagues E.N.E. of Iquique, at an elevation of some 10,000 feet, Messrs. George Smith and Co. are operating upon a large mass of "desmontes," and extracting, it is said, a profitable quantity of copper; it appears that these mines, at some distant date, had been worked for silver.

On the plain, about two miles from Iquique, Mr. John Williamson is working a copper mine which promises well; some ores taken from it during the year 1854 were sent to England to be smelted, their yield was over 60 per cent.

GUANO.—The island of Iquique was once thickly covered with guano; in the present century, whilst under the dominion of Spain, it was sold for 60,000 dols.; it has long since been cleared off. Between the Caleta of Pavillon and the river Lox, some 15 leagues, are many deposits, some several furlongs in length; it is chiefly taken away by small craft, "Huaveros," to supply the villages in the interior, and the ports to the north.

BORATE OF LIME AND OF SODA, in small lumps, covered with clay, was discovered in the province of Iquique in the year 1852. The first shipment made was a small quantity belonging to Mr. Peter King; in November of that year some parcels sent realised in England over £3 per cwt.; a prohibition to export it was published in 1853, on the plea that the trade of the province was to make nitrate of soda, and not to export a crude article; since then exporters have been obliged to obtain a licence from the supreme Government before they could ship. The exportation has been under 15,000 quintals; the price on the beach is now from 3.2 dols to 3.4 dols. per quintal.

PHILIPPINE ISLANDS.—The coasts of the Philippines extend 800 miles in length, and are deeply indented with bays; the interior is intersected by lakes and rivers, which in two parts of Manilla, their principal island, and seat of their capital, bring the opposite seas of China and the Pacific within a few leagues of each other, across a district very easily traversable; while the rest of the island (through which flow two principal lines of foreign navigation, between Europe and China, and the Philippines of South America,) are so situated in relation to each other, that their separation promotes more than their union would do a facility of internal and external communication strikingly attributable to the whole group, and peculiarly favourable to commercial and industrial relations.

The soil of the Philippines is exuberantly rich, and the commercial products of hemp, tobacco, sugar, indigo, coffee, sapan wood, rice and cocoa, are very extensively cultivated in some of the provinces, and susceptible of being so distributed among all the others.

Through this group is spread a population of from 3,500,000 to 4,000,000 of inhabitants who are christianized, and with the exception of a few mountain and petty tribes and the Mahometans in Mindanas, live in peaceful subordination to the official agencies of the Government here.

In the Island of Panay, which is below the 12th degree of latitude, and generally described by the name of its chief province Iloilo, the population is 559,861. The adjacent islands, Leyte and Samar, contain unitedly, nearly 800,000, and in Luzon, the population is little short of 2,000,000.

They are divided into three commercial divisions, north, central, and south, to the central giving all the provinces between the 13th and 15th degrees of latitude, to the south the group of Islands below the 13th, and to the north giving only three of the provinces, Pangasnian and the two Ilocoses with their dependents, Abra and the Union, and from this last division excluding the great range of country along the Pacific; each of these three divisions has a distinctiveness of character and commercial importance, in population, productions, wealth, industry and intelligence.

The northern part is very highly cultivated, and embraces a population of 724,946 inhabitants; and parallel to it is the large, though not numerously populated Province of Cagayan, not included in that division, and in which is cultivated the finest quality and largest quantity of tobacco in the Philippines.

The Southern Division contains a population of upwards of 1,200,000, and the central, which depends especially on Manilla, within the degrees of latitude I have indicated, is a zone of very great natural resources, and of varied productions, extensively cultivated, and containing nearly 1,500,000 of inhabitants.

Each of these divisions is of itself a sphere of commercial and industrial activity. From Pangasnian in the north is drawn a principal part of the sugar sent to England and to Europe; and from thence, and from Ilocos, the indigo which is exported in Zebu, Iloilo, and the Southern Islands, is produced the sugar which chiefly supplies Australia; besides hemp, buffalo hides, and horns, tortoiseshell, wax, and sandal wood, for the markets of Europe and the United States, and from the rich provinces which crescent Manilla, the same productions are sent for export through the capital, while, independent of foreign trade, the northern division as the granary of the Philippines, and of China in its seasons of dearth, and Pangasnian as the chief ship-building province of the Philippines; and Iloilo, and the south, as manufacturing districts, of webs of much value, and articles of extensive native consumption, have resources of local trade, which enrich and animate their industry.

In the northern division there are in one of the two provinces of Ilocos six towns with populations in each of from 5,000 to 8,000, five towns with from 10,000 to 18,000, and one with 31,000 inhabitants, and in Pangasnian six towns with from 5,000 to 8,000, seven from 8,000 to 17,000, two with upwards of 21,000, two of 16,000, and one with upwards of 19,000.

In the southern provinces, Zebu has fourteen towns with from 5,000 to 10,000 inhabitants, and five with from 10,000 to 12,000, and in the Island of Panay, or Iloilo, there are thirty-two towns with from 3,000 to 8,000, seven with 8,000 to 10,000, thirteen towns with from 10,000 to 15,000, four of 18,000, one of 21,450, and another of 29,820.

The cheapness and quality of their produce, and the commercial tendency and situation of these possessions generally, cannot be better illustrated than by the facts that, unfostered by the Spanish authorities, and uninfluenced by Spanish enterprise, which chiefly is directed here to monopolies, Government contracts, and the carrying and coasting trade, and depending, therefore, chiefly for foreign supplies and native returns on native industry and foreign houses, the Philippines, while principally trading with England and the United States, extend their relations to China, the western coasts of North America, Australia, India, France, Switzerland, and Germany. Yet, notwithstanding the large proportion of commercial resources which are cultivated and are cultivable in the distant divisions of these possessions, notwithstanding the aggregations of population I have enumerated in those provinces remote from the capital, and testifying the existence there of commercial elements, and an industrial and commercial spirit, and notwithstanding that, for nearly five months in the year, those northern and southern divisions have alternately their commercial relations with Manilla, and supplies of foreign manufacture, and exports of native produce suspended by the opposing monsoons, which impede nearly all navigation with them; the foreign trade of the Philippines is, at present, like that of Japan (though without being exclusive to one foreign nation) confined by law to the port of Manilla; here alone can come from abroad, to be discharged for distribution throughout these possessions, the manufactures of Great Britain and other countries, and here have to be brought from their remotest provinces, for purchase at Manilla by foreign merchants, every exportable article of native industry and produce.

The imports and exports have thus their natural expansibility compressed by the heavy charges of intermediate and unnecessary agency, shipments, storage, porterage, risks, insurance, and the interest of money, and wear and tear to which they are subject; and as the same restrictive spirit prohibits foreigners from going into the interior (even for mere purposes of recreation, except by special and charily conceded permission) our merchants here can do nothing to augment the consumption of foreign manufactures, by stimulating the caprices of provincial taste, and the produce they receive and send to their home markets they are obliged to take in the state (susceptible of much improvement) in which it may be brought to them. While a further restricting effect of the existing law, is that the provincial agency of manufactures and produce between our merchants and consumers is chiefly, and I may almost say entirely, conducted by a class of men, natives or of middle caste, individually with little capital, and credit in their relations with, and in the estimation of, the foreign houses here.

Home Correspondence.

COPYING PICTURES IN PUBLIC GALLERIES.

Sir,—Some pertinent remarks were recently inserted in the Society's *Journal* upon the practice of copying pictures in our public galleries, from which it appears that we are encouraging the growth of a class of copyists who make a livelihood by the multiplication of the most popular works, especially those of our modern painters. It is probable that permission to copy has been readily granted, and that the practice has obtained a footing without due consideration of the principles which it involves. They are, however, worthy of the examination of the Society of Arts, which is now at work to secure to artists a well-defined parliamentary title in their productions.

The National pictures in Trafalgar-square are open to the public for four days in each week; and on the remaining two days "to students only." The works of the painters of our own school at South Kensington are under the same control, and are subject to the same rule, except those constituting the treasured gift of Mr. Sheepshanks, which are under different management and regulation. The public thus gives up the enjoyment of its Art Galleries for two days in every six, for the benefit of Art Students, and, further, the public provides the Art Student with every facility, in its well-warmed and lighted galleries, on the two days devoted to his use. The public has therefore every right to inquire whether this sacrifice of its convenience and its money really tends to the promotion of art, by the education of the true artist, as well as whether any interests, public or private, may suffer by the unrestricted privileges which have been granted.

First, as to the practice of copying, as a necessary part of the Student's Art training. After an initiatory course of drawing, he has to learn, with the use of his palette and pigments, the different processes of painting—and for this purpose it is of great value to him to have access to works of good art, in which the manner of painting finds its best exemplification. In copying or extracting from these for from six to twelve months, the industrious student usually finds that he has mastered the materials and the processes of his art, and he is eager to test them in the trial of his inventive powers. He still visits the Galleries of his own, and, if within his reach, of foreign countries, not to make copies, but to store his mind and his note-book, and to feast his instructed eye in all that art has produced—the invention and grace of one master—the composition and style of another—the colour and harmony of a third—in fact the different excellences of each. If he copies it is only to possess himself of some prized remembrance, usually only the portion of a picture, as a delight and an example. This is the mode and limit of copying prescribed to a Student of the Royal Academy, and that which has been recommended by all the great teachers of art.

Secondly—But this is not the practice followed in our National Gallery. Your correspondent, whose remarks are verified by observation, shews that those admitted to study—"Students"—abuse their privilege—that they make innumerable copies of the same picture, which are not for the purpose, and cannot serve the purpose, of study, but are made for sale and are sold. And the best experience proves that these hackneyed copyists—I do not wish to use the term offensively—never become artists, that from indolence or inability,—frequently the former—they fail entirely in that invention which constitutes art—and become *habitués* of the Galleries—mere copyists, pirating the thoughts of others, but artists never.

The public then sacrifices its convenience and its money, and fails in the promotion of art, an object doubly precious in a great commercial community. On the other hand, may not art suffer by the diffusion, under the existing system, of numerous bad and hasty copies of fine works made to sell, and, in the possession of the unscrupulous, likely to become objects for imposition? Is this fair, either to the interests or feelings of the cotemporary artist, sensitive in all that relates to his works, or to the memory of those who have passed from us? Should their cherished labours be subjected to such a use? It is the natural penalty of all great inventors to be followed by herds of imitators—but it has remained to the present day to deliver over to the mercenary copyist the works of our living painters. Hitherto an artist has been usually and properly consulted as to the mode of engraving his works even, and he has always felt much delicacy himself in making a replica of a picture which has passed from his own possession.

If these premises are well-founded, then it behoves the Trustees of our National Gallery to make some change in their regulations—both in the interests of the public, the art-student, and the artist. It would go some way towards a more wholesome state of things, if the Trustees were to restrict the permission to copy to young students in art, and to a term of six months, to be renewed for a further term not exceeding six months, on a satisfactory report of the use made of the first term—and to all other persons, to limit the permission to the one particular picture which may be the object of the request. The restriction ought, however, in justice to the living artist, to be carried further, and his works, except with his sanction, be prohibited to the Copyist, to whom the works of the old masters afford the best examples of every mode of execution.—I am, &c.,

S. R.

ACCLIMATISATION OF ANIMALS.

Sir,—In Mr. Buckland's interesting paper on this subject, one or two points appear to have been overlooked by the author, and also by the gentlemen who addressed the meeting after the paper.

In submitting these thoughts to your readers, I would not be understood to speak more than suggestively, for although they are true so far as my individual limited experience goes, and may be capable of enlargement in the same sense, they may, on the other hand, be accounted for on quite other grounds by more extended observations.

I conclude the following to be general laws:—

1. That the most delicate-eating fish are found in temperate latitudes.

2. That fish either wholly inhabiting, or occasionally visiting the sea, are most appreciated as human food.

3. That as we advance to more tropical regions, river fish take the place of sea fish as articles of diet.

Assuming these statements to be correct, to even a limited extent only, they may be worthy of consideration by the Society, to temper too sanguine expectations that might be raised of the result of introducing new species of fish into some of our colonies. As we get into warm latitudes, and approach the tropics, we soon become conscious of being in the presence of monsters of prey, both of the fish and reptile class.

I would moot, then, as a subject of inquiry, the question whether the delicate flavour of our northern fish, cod, salmon, &c., is not in some measure owing to the repose in which they exist, as compared to those fish which live in a condition of violent persecution. I presume it may be taken as a fact that most, if not all, fish obtained where sharks abound are comparatively dry, tough, and without flavour. On Darwin's principle this would probably be explained by stating that, in the struggle for existence, the weak, heavy, flesh-forming fish are devoured by their more voracious brethren, and only the more muscular kinds are able to maintain their position. In the rivers of warm countries the fish pass their existence in a state of greater repose than their sea congeners, and hence perchance the reason why such fish develop more flavour and are selected for the table.

It would seem, therefore, highly important, before estimating the result of any endeavour to introduce our fish into some of our colonies, to take into the calculation the probable effect of their exposure to attacks from new and vigorous enemies, as well as the difficulties of becoming accustomed to new conditions of existence, both as regards climate and procuring food and safe gratification for their migratory instincts, whether for spawning or feeding. In addition to noticing the prevalence of sharks, dog-fish, &c., which abound in warm climates, I may say that the rivers of Australia, referred to by Mr. Buckland, have a more sluggish character than those to which the salmon are accustomed, and I have some doubts whether, except in Van Diemen's Land, the salmon would readily accommodate itself to its new home. The south portion of New Zealand affords a character more similar to its native habitat, and as the southern province of that colony is principally tenanted by Scotchmen, it would be welcomed, and every facility afforded for its introduction and propagation by persons conversant with the fish and its habits.

On the general question of introducing animals into this country, I would remark that, although venison was highly prized at one period in comparison with other food, the modern improvements in the quality of our beef and mutton should not be overlooked, by which the strong comparison to their disparagement which probably once existed no longer obtains; however, for the sake of varying the rotation crop of flesh dinners, it is desirable to introduce an animal of the deer tribe, if its breeding can be rendered as profitable to the grazier as the present domestic animals, but only for the sake of variety, as the deer eats the same description of food as the sheep and ox, it consumes food which is equally and profitably eaten by them; and it is a question of substitution of one animal for another more that one of addition.

As a rule, it appears to me that all wild or semi-wild animals, as the deer and goat, must give way, when land becomes enclosed and cultivated, to the more domesticated animals; goats are disappearing, even in places which seem peculiarly fitted for them, before sheep, although goat and kid are not at all objectionable, at least I have grateful recollections of these viands; hence the changing and progressive circumstances of cultivation must be borne in mind before the mere introduction of new forms of herbivora can be considered of permanent value. It must be shown that the cost per head will not exceed that of an equivalent number of sheep or oxen, and that the result will be as profitable.

To any one conversant with the kangaroo, it cannot be deemed more than theory to advocate its introduction, unless a system of stall-feeding can be shown to be profitable, and more so than an equal weight of beef. The keeping of kangaroos in herds in this country I cannot conceive. As, however, we can more readily import grain and vegetable food than living animals, some great good may be done by earnestly carrying out reasonable experiments. Our fields being tolerably well occupied by oxen and sheep, the most profitable and useful to man of all vegetable-feeding animals, unless we ignore the experience of all ages since the creation, there is not, therefore, much hope of superseding them advantageously; but probably there may be numerous animals which, like the rabbit, would live and thrive as well in confinement as in the fields, and these might possibly be introduced with reasonable hopes of adding to our resources for animal food. Nor should our friends be daunted by want of immediate success; it frequently requires a long time for the taste to appreciate unaccustomed articles of diet, and a new dish should seldom be introduced by direct name, but rather as something recommended by the cook; thus a march is stolen upon prejudice. That tastes may change, I could give numerous curious proofs; suffice that on one occasion I was present at a dinner party, when attention was called to the fact that six persons were partaking, by choice and with relish, of a dish which they had all declined as unpalatable only twelve months before.

In offering the preceding remarks, I have had no desire to damp the ardour of experimenters; my object has been more to suggest the limiting of exertions to the probable, than the allowing energy to be wasted on what may simply be possible.

In conclusion, it may not be unworthy of notice, as characteristic of our neighbours, that neglecting the improvement of their own terribly bad beef and mutton, a commonplace practical matter, they grasp at the ideal of peopling their scantily supplied country with novel forms of animal life.

I am, &c.,
WILLIAM STONES.

Dec. 18, 1860.

MEETINGS FOR THE ENSUING WEEK.

TUES. ...Royal Inst. 3. Professor Faraday, "On the Chemical History of a Candle."
Pathological, 8. Anniversary.
Photographic, 8.
WED. ...Pharmaceutical, 8.
Ethnological, 8½.
THURS...Royal Inst. 3. Professor Faraday, "On the Chemical History of a Candle."
Zoological, 4.
FRI. ......Archœological Inst., 4.
SAT. ...Asiatic, 3.
Royal Inst. 5. Prof. Faraday, "On the Chemical History of a Candle."

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, December 7th*, 1860.]

Dated 4th December, 1860.

2977. G. F. Stidolph, Ipswich, T. Simpson and J. R. Morley, Woodbridge, and J. Stidolph, Ipswich—Imp. in the construction of crates and other packing cases.
2979. J. B. Payne, Chard, Somersetshire—Imp. in machinery for the manufacture of fishing and other nets.

Dated 5th December, 1860.

2981. G. W. Hart, 9, Stanley-terrace, Southsea—Imp. in the embrasures of fortifications, and in the portholes of ships of war.
2983. C. W. Lancaster, New Bond-street—Imp. in sights for rifles and other fire arms.
2985. E. Morewood, Enfield—Imp. in coating metals.
2987. G. C. Lingham and J. Nicklin, Birmingham—Certain imp. in belt-fastenings, and which said improvements are also applicable as a connector for brace-fronts, garters, and other articles of dress

[*From Gazette, December* 21*st*, 1860.]

Dated 6*th September*, 1860.

2150. C. A. Schneider, 9, Albany-street, Regent's-park—Imp. in manufacturing letters, numerals, arms, designs, trade-marks, mosaic and other ornaments to be attached to glass or other smooth surface.

Dated 22*nd October*, 1860.

2572. A. Dietz, New York, U.S.—A new and useful method of treating skins and hides during or after the process of tanning or finishing them, and of aiding the tanning of hides and skins.

Dated 26*th October*, 1860.

2614. R. Tiernan, Liverpool—Imp. applicable to infants' and invalids' feeding bottles, and other purposes.

Dated 2*nd November*, 1860.

2690. W. E. Newton, 66, Chancery-lane—An improved press for compressing substances for packing in the form of bales, or for other purposes. (A com.)

Dated 9*th November*, 1860.

2748. J. P. Fittère, Castelnau Magnoac, France—Imp. in portable sawing machines.

Dated 16*th November*, 1860.

2812. J. C. M. Béziat, 51, Rue de Malte, Paris—Imp. in the means or apparatus employed for permitting, stopping, and regulating the passage of steam, water, and gases.

Dated 17*th November*, 1860.

2831. A. L. Léveque, Paris—An improved apparatus for carburating or naphthalising lighting gas.

Dated 22*nd November*. 1860.

2864. R. A. Brooman, 166, Fleet-street—Imp. in apparatus for communicating continuous rotary motion from manual power. (A com.)

Dated 23*rd November*, 1860.

2870. W. Manwaring, Banbury—Imp. in the gearing of mowing and other light portable machines.

2872. J. Coupe, Blackburn—Imp. in power looms for weaving.

2874. B. Beniowski, Bow-street, Westminster—Imp. in the manufacture of types and in cases to be used therewith.

Dated 26*th November*, 1860.

2892. J. W. Hadwen, Kebroyd Mills, Halifax—Imp. in the treatment of silk waste, waste silk, or silken fibre, and in the manufacture of yarns and tissues for the same, whether alone or in admixture with other materials.

Dated 27*th November*, 1860.

2908. W. S. Wood, Chislehurst, Kent—An improved arrangement of apparatus for curing smoky chimnies, and for ventilating purposes.

Dated 28*th November*, 1860.

2920. H. Grafton, 80, Chancery-lane—Imp. in the application of machinery to the cultivation of land.

Dated 29*th November*, 1860.

2935. J. A. Fenshaw, and J. A. Jaques Tottenham—Imp. in brushes and other scrubbing and rubbing surfaces.

Dated 1*st December*, 1860.

2945. R. Dawbarn, Wisbech, Cambridgeshire—An apparatus for stopping rents or holes in fire-engine hose and other elastic tubes or pipes. (A com.)

2952. J. Ronald, Liverpool—Imp. in machinery for the spinning of hemp, flax, manilla, or wool, or other like fibrous materials.

2954. T. Shedden, Ardgarton House, Argyle, N.B.—Imp. in ammunition for fire arms, and in packing the same for transport, and in the apparatus employed therein.

Dated 3*rd December*, 1860.

2960. W. Galloway and J. Galloway, Manchester—Imp. in steam boilers.

2962. W. R. Barker, Chapel-street, Belgrave-square—Imp. in bottles for medicines and poisons.

2964. J. Lowden, and R. Buckley, Royton, Lancashire—Certain imp. in carding engines.

2966. J. T. Carter, and J. Austen, Sydenham—An improved method of roughing horse shoes.

2968. T. Whitehead, Holbeck, Leeds—Improved machinery for combing wool, hair, flax, tow, cotton, silk, and other fibrous substances.

Dated 4*th December*, 1860.

2974. F. Jaques, Droylsden, near Manchester—Imp. in or improved apparatus applicable to rifled or other muskets, and to other fire-arms.

2976. R. Griffiths, 69, Mornington-road, Hampstead-road—Imp. in screw propeller blades.

2978. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in the construction of clothes dryers, or folding racks for airing and drying clothes.

2980. C. S. Duncan, Hereford-road North, Bayswater—Imp. in the construction of electric telegraph cables or ropes.

Dated 5*th December*, 1860.

2984. G. Hallett, 52, Broadwall, Lambeth, Surrey—Imp. in coating iron and other ships' bottoms, and other surfaces.

2986. B. Gorrill, Birmingham—Certain imp. in the making of gilding tools, for gilding or embossing ornaments on leather and other surfaces.

Dated 6*th December*, 1860.

2989. H. Jordan, Liverpool—Imp. in the construction of ships or other vessels.

2990. J. F. Pratt, Oxford-street—Imp. in instruments for receiving or transmitting sound, particularly adapted to the relief of deafness.

2991. R. A. Glass, Greenwich, Kent—A method of and apparatus for preserving electric telegraph cables and wires prior to their being laid.

2992. M. Deavin, Rotherhithe, Surrey—An improved apparatus applicable as a fire-escape, also to the raising and lowering of weights.

2993. T. Mellodew, Oldham, C. W. Kesselmeyer, Manchester, and J. M. Worrall, Salford—Imp. in the treatment of velvet, velveteens, and other fabrics on which there are floated weft threads to be cut.

2994. J. Bellamy, Wednesfield, near Wolverhampton, Staffordshire—Imp. in traps for taking rats, birds, rabbits, and other animals.

Dated 7*th December*, 1860.

2995. J. Musgrave, Bolton-le-Moors—Imp. in apparatus for regulating the discharge of water from steam pipes.

2996. J. C. Haddan, 14, Bessborough-gardens, Pimlico—Imp. in the manufacture of cannon, and of projectiles, part of which improvements is applicable to casting metal.

2997. P. Guerin, Cluny France—Imp. in the hydraulic press.

2999. F. H. Edwards, Newcastle-upon-Tyne—Imp. in air engines.

3000. S. Holman, Lewisham, Kent—Imp. in machinery for communicating motion to and transmitting motion from reciprocating rods.

3001. J. B. Tuttle, 93, Minories—Imp. in the means of communicating signals, applicable to naval, military, and railway purposes.

3002. W. Clark, 53, Chancery-lane—Imp. in machinery for planing or cutting wood, and in apparatus connected therewith. (A com.)

3003. J. J. Wheble, Reading, Berkshire—Imp. in the manufacture of artificial stone for building purposes.

3004. B. G. George, Hatton-garden—Imp. in the mounting of tablets or show bills, and also of prints and drawings.

3005. T. Foxall, Princes-street, Fitzroy-square—An improved canteen or case for obtaining refreshments for soldiers or travellers.

INVENTION WITH COMPLETE SPECIFICATION FILED.

3105. C. Stevens, 1A, Welbeck-street, Cavendish-square—An improved cooking stove. (A com.)—18th December, 1860.

PATENTS SEALED.

[*From Gazette, December* 21*st*, 1860.]

December 21*st*.

1516. H. Palmer & H. S. Swift.
1526. R. A. Brooman.
1536. P. Pailleron.
1542. G. Davies.
1543. W. Routledge.
1546 W. Hooper.
1559. M. J. L. Latta.
1561. J. C. Evans.
1562. W. H. Fletcher.
1566. J. Blakeley and W. H. Blakeley.
1567. C. Bosselaers.
1569. W. Campion and W. Campion.
1578. W. Hale.
1584. T. Cox, jun., R. Harrington, and W. Holland.
1586. R. Laming and C. Smith.
1588. C. P. Gontard.
1634. W. Grimshaw.
1674. J. Jack.
1720. W. Birks, sen., and W. Birks, jun.
1734. J. Goulson.
1740. R. Oxland.
1804. H. C. Ash.
18 0. H. Jackson.
1858. W. Pickstone.
2128. T. Grimston.
2348. M. Jacoby and J. Stones.
2468. R. Hornsby, jun.
2544. A. V. Newton.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, December* 21*st*, 1860.]

December 17*th*.

3095. M. J. Turner and M. W. Turner.
3113. J. M. Napier.
3114. R. Oxland.
3118. R. Furnival.

December 18*th*.

3121. R. A. Brooman.
3175. J. Cottrill.
4183. E. Gomez and W. Mills.

[*From Gazette, December* 25*th*, 1860.]

December 20*th*.

3136. W. Beresford.
3137. A. R. le Mire de Normandy

December 21*st*.

3177. I. Holden.

December 22*nd*.

3150. A. F. Kynaston.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[*From Gazette, December* 21*st*, 1860.]

December 19*th*.

48. R. Husband.
60. A. Drevelle.

[*From Gazette, December* 25*th*, 1860.]

December 20*th*.

3022. A. V. Newton.

December 22*nd*.

2985. F. Bennoch.
3000. T. S. Prideaux.